WHAT IS CLAIMED IS:

1. An electrical power generating system, comprising:

a vibrating assembly including a vortex shedding device which sheds vortices in response to fluid flow across the vibrating assembly; and

a generator which generates electrical power in response to vibration of the vibrating assembly,

wherein the vortex shedding device sheds the vortices at a frequency which is substantially equal to a resonant frequency of the vibrating assembly.

2. The system according to claim 1, wherein the vibrating assembly further includes an elastic support for the vortex shedding device, the elastic support biasing the vortex shedding device toward a neutral position against lift forces produced by the vortices.

3. The system according to claim 1, wherein the vortices produce alternating lift forces on the vibrating assembly, thereby causing the vibrating assembly to vibrate.

4. The system according to claim 1, wherein the generator includes an electromagnetically active material in which strain is induced in response to vibration of the vibrating assembly.

5. The system according to claim 4, wherein motion of the vibrating assembly is transmitted to the electromagnetically active material via a leveraging mechanism which decreases an amplitude of the motion.

6. The system according to claim 5, wherein the leveraging mechanism elastically supports the vortex shedding device, thereby influencing the resonant frequency of the vibrating assembly.

7. The system according to claim 1, wherein the generator includes at least one magnet which is displaced relative to a coil in response to vibration of the vibrating assembly.

8. The system according to claim 1, further comprising a substantially rigid arm connecting the vortex shedding device to the generator, and wherein an elastic support supports the arm between the vortex shedding device and the generator.

9. The system according to claim 1, further comprising a tubular string having a flow passage formed therethrough, and wherein the vortex shedding device is positioned in a recess internally formed in the tubular string, the recess being laterally offset from the flow passage and in fluid communication with the flow passage.

10. The system according to claim 1, wherein the generator includes an electromagnetically active material attached to a beam of the vibrating assembly, so that strain in the beam is transmitted to the material, and electricity is produced in response to the strain in the material.

11. The system according to claim 1, wherein the vibrating assembly and the generator are positioned in a wellbore of a well.

12. An electrical power generating system, comprising:

an elongated arm;

a vortex shedding device;

an electrical power generator which generates electrical power in response to displacement of the arm; and

an elastic support which supports the arm against alternating lift forces produced by vortices shed by the vortex shedding device.

13. The system according to claim 12, wherein the arm vibrates at a resonant frequency in response to the alternating lift forces.

14. The system according to claim 13, wherein a frequency of the vortices shed by the vortex shedding device is substantially equal to the resonant frequency.

15. The system according to claim 12, wherein the generator includes an electromagnetically active material in which strain is induced when the arm vibrates.

16. The system according to claim 15, wherein the generator further includes a leveraging mechanism which reduces a displacement amplitude of the

arm, and which applies the reduced amplitude to the electromagnetically active material.

17. The system according to claim 16, wherein the leveraging mechanism includes an integrally formed lever device having multiple flexure pivots formed thereon.

18. The system according to claim 16, wherein the leveraging mechanism and the electromagnetically active material form portions of the elastic support.

19. The system according to claim 12, wherein the generator includes at least one magnet and at least one coil, relative displacement between the coil and magnet producing electricity in response to vibration of the arm.

20. The system according to claim 19, wherein the generator includes at least two of the magnets and at least two of the coils, at least one of the magnets and at least one of the coils being positioned on each of opposite lateral sides of the arm.

21. The system according to claim 12, wherein the vortex shedding device is positioned in a recess laterally offset from a flow passage.

22. The system according to claim 21, wherein the recess is in fluid communication with the flow passage.

23. The system according to claim 21, further comprising a flow diverter positioned in the recess.

24. The system according to claim 23, wherein the flow diverter increases a velocity of fluid impinging on the vortex shedding device in the recess.

25. The system according to claim 23, wherein the flow diverter causes fluid flowing through the recess to impinge on the vortex shedding device at an angle relative to a longitudinal axis of the passage, the angle being substantially greater than zero.

26. The system according to claim 25, wherein the angle is approximately 20 degrees to approximately 60 degrees.

27. The system according to claim 21, wherein the flow passage is formed through a tubular string.

28. The system according to claim 27, wherein the tubular string is positioned in a wellbore.

29. The system according to claim 21, wherein a flow diverter influences fluid in the passage to flow toward the recess.

30. The system according to claim 29, wherein the flow diverter includes at least one projection extending into the passage opposite the recess.

31. The system according to claim 29, wherein the flow diverter includes at least one vane positioned in the passage.

32. The system according to claim 31, wherein the vane is rotatably mounted relative to the passage.

33. The system according to claim 32, further comprising a biasing device which biases the vane to restrict flow through the passage, thereby diverting flow toward the recess.

34. The system according to claim 12, wherein the arm is substantially rigid.

35. The system according to claim 12, wherein the elastic support supports the arm between the vortex shedding device and the generator.

36. The system according to claim 12, wherein the vortex shedding device sheds the vortices in response to fluid flow through a flow passage, and wherein the arm vibrates at a resonant frequency which is substantially equal to a frequency of the vortices over a predetermined range of velocity of the fluid flow.

37. The system according to claim 12, wherein the vortex shedding device is positioned in a channel laterally offset from a flow passage extending through the system.

38. The system according to claim 37, wherein the channel has opposite ends each of which is in fluid communication with the flow passage.

39. The system according to claim 38, wherein the channel is isolated from the flow passage between the opposite ends of the channel.

40. The system according to claim 37, further comprising a flow diverter positioned in the channel.

41. The system according to claim 40, wherein the flow diverter increases a velocity of fluid impinging on the vortex shedding device in the channel.

42. The system according to claim 40, wherein the flow diverter causes fluid flowing through the channel to impinge on the vortex shedding device at an angle relative to a longitudinal axis of the passage, the angle being substantially greater than zero.

43. The system according to claim 42, wherein the angle is from approximately 20 degrees to approximately 60 degrees.

44. The system according to claim 37, wherein the flow passage is formed through a tubular string.

45. The system according to claim 44, wherein the tubular string is positioned in a wellbore.

46. The system according to claim 37, wherein a flow diverter influences fluid in the passage to flow toward the channel.

47. The system according to claim 46, wherein the flow diverter includes at least one projection extending into the passage opposite the channel.

48. The system according to claim 46, wherein the flow diverter includes at least one vane positioned in the passage.

49. The system according to claim 48, wherein the vane is rotatably mounted relative to the passage.

50. The system according to claim 49, further comprising a biasing device which biases the vane to restrict flow through the passage, thereby diverting flow toward the recess.

51. The system according to claim 12, wherein the arm is substantially more rigid than the elastic support.

52. The system according to claim 12, wherein fluid flow impinges on the vortex shedding device at a greater velocity than the fluid flow impinges on the arm.

53. The system according to claim 12, wherein the vortices impinge on at least one surface area attached to the arm to thereby produce the alternating lift forces.

54. The system according to claim 53, wherein the surface area is formed on the vortex shedding device downstream of a portion of the vortex shedding device at which the vortices are shed.

55. The system according to claim 12, further comprising a flow diverter which increases a velocity of fluid impinging on the vortex shedding device.

56. The system according to claim 12, further comprising a flow diverter which causes fluid flowing through the system to impinge on the vortex shedding device at an angle substantially greater than zero.

57. The system according to claim 56, wherein the angle is from approximately 20 degrees to approximately 60 degrees.

58. The system according to claim 12, wherein the generator includes at least first and second magnets which displace in opposite directions relative to respective first and second coils in response to displacement of the arm.

59. The system according to claim 12, wherein the generator includes a first magnet which displaces in a first direction relative to a first coil while a second magnet displaces in a second direction relative to a second coil when the arm displaces, the first direction being opposite to the second direction.

60. The system according to claim 12, wherein the system is positioned in a wellbore of a subterranean well.